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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,040	09/30/2003	John K. Walton	EMC2-131PUS	5449
	7590 07/23/2007 SHARKANSKY	EXAM	INER	
PO BOX 557			WINDER, P	ATRICE L
MASHPEE, MA 02649			ART UNIT	PAPER NUMBER
		·	2145	
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			07/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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	Application No.	Applicant(s)	_
	10/675,040	WALTON ET AL.	
Office Action Summary	Examiner	Art Unit	-
	Patrice Winder	2145	
The MAILING DATE of this communication ap Period for Reply	ppears on the cover sheet with	the correspondence address	
A SHORTENED STATUTORY PERIOD FOR REPL WHICHEVER IS LONGER, FROM THE MAILING D. - Extensions of time may be available under the provisions of 37 CFR 1. after SIX (6) MONTHS from the mailing date of this communication. - If NO period for reply is specified above, the maximum statutory period. - Failure to reply within the set or extended period for reply will, by statut Any reply received by the Office later than three months after the mailing earned patent term adjustment. See 37 CFR 1.704(b).	DATE OF THIS COMMUNICA .136(a). In no event, however, may a reply I will apply and will expire SIX (6) MONTH: te, cause the application to become ABAN	TION. be timely filed from the mailing date of this communication. DONED (35 U.S.C. § 133).	
Status			
1) Responsive to communication(s) filed on 30 S	September 2003.		
2a) This action is FINAL . 2b) ⊠ Thi	is action is non-final.		
3) Since this application is in condition for allowa	ance except for formal matters	s, prosecution as to the merits is	
closed in accordance with the practice under	Ex parte Quayle, 1935 C.D. 1	1, 453 O.G. 213.	
Disposition of Claims			
4) ☐ Claim(s) 1-10 is/are pending in the application 4a) Of the above claim(s) is/are withdra 5) ☐ Claim(s) is/are allowed. 6) ☐ Claim(s) 1-10 is/are rejected. 7) ☐ Claim(s) is/are objected to. 8) ☐ Claim(s) are subject to restriction and/	awn from consideration.		
Application Papers			
9) ☐ The specification is objected to by the Examin 10) ☑ The drawing(s) filed on 09 February 2004 is/an Applicant may not request that any objection to the Replacement drawing sheet(s) including the correct 11) ☐ The oath or declaration is objected to by the E	re: a)⊠ accepted or b)⊡ ob e drawing(s) be held in abeyance ction is required if the drawing(s)	. See 37 CFR 1.85(a). is objected to. See 37 CFR 1.121(d).	
Priority under 35 U.S.C. § 119			
12) Acknowledgment is made of a claim for foreign a) All b) Some * c) None of: 1. Certified copies of the priority document 2. Certified copies of the priority document 3. Copies of the certified copies of the priority document application from the International Bureat * See the attached detailed Office action for a list	nts have been received. Its have been received in Apportity documents have been reau (PCT Rule 17.2(a)).	lication No ceived in this National Stage	
Attachment(s) 1) Notice of References Cited (PTO-892) 2) Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 5-20-2005; 5-23-2005.	Paper No(s)/N	nmary (PTO-413) Mail Date rmal Patent Application	

Art Unit: 2145

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1 and 10 are provisionally rejected on the ground of nonstatutory double patenting over claim 1 of copending Application No. 10/112,598. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows:

Art Unit: 2145

Present application	Application 10/112, 598
1. A system interface comprising: plurality of directors, one portion of such directors being adapted for coupling to a host computer/server and another portion of the directors being adapted for coupling to a bank of disk drives, the plurality of directors being interconnected through a network; and	1. A data storage system for transferring data between a host computer/server and a bank of disk drives through a system interface, such system interface comprising: a plurality of first directors coupled to the host computer/server; a plurality of second directors coupled to the bank of disk drives; wherein a pair of the first directors are adapted for coupling to the pair of logic networks.
a common resource section for providing a	a cache memory, such cache memory
resource shared among the plurality of	having: a common memory array having
directors.	a pair of redundant data/control ports;
	a pair of logic networks each one coupled
	to a corresponding one of the pair of
	data/control ports; wherein there are
	separate point-to-point data paths between

Art Unit: 2145

	each one of the directors and the global
	cache memory;
Regarding dependent claim 10, including a	a cache memory, such cache memory
cache memory coupled to the directors	having: a common memory array having
and the shared resource though the	a pair of redundant data/control ports;
network.	a pair of logic networks each one coupled
	to a corresponding one of the pair of
	data/control ports; wherein there are
	separate point-to-point data paths between
	each one of the directors and the global
	cache memory;

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

3. Claims 1 and 10 are rejected on the ground of nonstatutory double patenting over claim 11 of U. S. Patent No. 7,007,194 B1 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows:

Art Unit: 2145

Present application	US Patent No. 7,007,194 B1	
A system interface comprising:	11. A data storage system for	
	transferring data between a host	
	computer/server and a bank of disk drives	
	through a system interface, such	
	system interface comprising:	
plurality of directors, one portion of such	a plurality of first directors coupled to host	
directors being adapted for coupling to a	computer/server; a plurality of second	
host computer/server and another portion	directors coupled to the bank of disk	
of the directors being adapted for coupling	drives;	
to a bank of disk drives, the plurality of	a messaging network, operative	
directors being interconnected through a	independently of the data transfer section,	
network; and	coupled to the plurality of first directors	
	and the plurality of second directors;	
a common resource section for providing a	a data transfer section having a cache	
resource shared among the plurality of	memory, such cache memory being	
directors.	coupled to the plurality of first and second	
	directors,	

Art Unit: 2145

Regarding dependent claim 10, including a cache memory coupled to the directors and the shared resource though the network.

wherein the first and second directors
control data transfer between the host
computer and the bank of disk drives in
response to messages passing between at
least a pair of the plurality of first and
second directors through the messaging
network with such data passing through
the cache memory in the data transfer
section; and
wherein there are separate point-to-point
data paths between each one of the
directors and the cache memory.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Application/Control Number: 10/675,040 Page 7

Art Unit: 2145

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 9 recites the limitation "the redundant network" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

- (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.
- 7. Claims 1-5 and 7-9 are rejected under 35 U.S.C. 102(e) as being anticipated by DeKoning et al., USPN 6,754,853 B1 (hereafter referred to as DeKoning).
- 8. Regarding claim 1, DeKoning taught a system interface (column 4, lines 12-17) comprising:

plurality of directors, one portion of such directors being adapted for coupling to a host computer/server and another portion of the directors being adapted for coupling to a bank of disk drives, the plurality of directors being interconnected through a network (column 4, lines 43-45); and

Art Unit: 2145

a common resource section for providing a resource shared among the plurality of directors (column 3, lines 15-16; column 4, lines 27-35; column 5, lines 2-5).

Page 8

- 9. Regarding dependent claim 2, DeKoning taught the common shared resource section includes a shared computer code used by the plurality of directors (column 3, lines 15-19; column 4, lines 33-35).
- 10. Regarding dependent claim 3, DeKoning taught the code includes computer code for booting up each one of the plurality directors (column 4, lines 33-35; column 6, lines 31-35).
- 11. Regarding dependent claim 4, DeKoning taught the common shared code storage section is interconnected to the directors through the network (column 4, lines 35-39).
- 12. Regarding dependent claim 5, DeKoning taught including second, redundant common shared resource section (Figure 1 taught RAM 129 and firmware 128 associated with both controllers 124 and 126).
- 13. Regarding dependent claim 7, DeKoning taught such system interface includes a second, redundant network coupled to the second shared resource section for use in interconnecting the directors in the event the first mentioned one of the shared resource sections fails (Figure 1 taught multiple network fabrics 132, column 4, lines 45-48).
- 14. Regarding dependent claim 8, DeKoning taught the network is a packet switching network (column 1, lines 33-35; column 4, lines 22-25).

Application/Control Number: 10/675,040 Page 9

Art Unit: 2145

15. Regarding dependent claim 9, DeKoning taught the redundant network is a packet switching network (column 1, lines 33-35; column 4, lines 45-48).

Claim Rejections - 35 USC § 103

- 16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
 - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
- 17. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:
 - 1. Determining the scope and contents of the prior art.
 - 2. Ascertaining the differences between the prior art and the claims at issue.
 - 3. Resolving the level of ordinary skill in the pertinent art.
 - 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
- 18. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeKoning in view of Bramhall et al., USPN 6,675,258 B1 (hereafter referred to as Bramhall). Regarding dependent claim 6, DeKoning does not specifically teach a second, redundant common shared resource section. However, Bramhall taught second, redundant common shared resource section stores computer code used by the plurality of directors in the event the first mentioned one of the common shared code storage section fails (column 4, lines 23-29, 61-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made that incorporating Bramhall's

Art Unit: 2145

second, redundant common shared resource section in DeKoning's system for determining faults in a data storage system would have improved reliability. The motivation would have been because providing redundant firmware would ensure operability despite controller failures.

- 19. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeKoning in view of Guha et al., USPN 7,181,57 B1 (hereafter referred to as Guha).
- 20. Regarding dependent claim 10, DeKoning does not specifically teach including a cache memory coupled to the directors and the shared resource though the network. However, Guha taught teach including a cache memory coupled to the directors and the shared resource though the network (column 11, lines 43, 59). It would have been obvious to one of ordinary skill in the art the time the invention was made that incorporating Guha's cache memory in DeKoning's system for determining faults in a data storage system would have improved storage management. The motivation would have been to better manage fail-over during storage device faults.

Conclusion

- 21. Shagam, USPN 6,397,295 B1: taught disk controller and host computers, in order to increase their throughput, can include cache memories which store data to be written to a global memory and taught an improvement for preventing "stale" cache data.
- 22. Oldfield et al., US 2002/0133740 A1: taught a redundant controller data storage system, wherein each controller has its own memory that is the mirror image of the

Art Unit: 2145

other controller. The mirrored memories allow for fast recovery in case of failure or loss of one controller or its memory.

- 23. Oliveira et al., USPN 6,766,359 B1: taught a plurality of directors in connected through a network, such that one portion of such directors are adapted for coupling to a host computer/server and another portion of the directors are adapted for coupling to disk drives and a cache memory.
- 24. Purcell et al., USPN 6,836,815 B1: taught processor crossbars PXB provide interconnections between processors P and memory crossbars MXB. Memory crossbars MXB provide interconnections between memory controllers MC and processor crossbars PXB.
- 25. Pittelkow et al., USPN 7,003,668 B1: taught a system and method for a reserved memory area shared by all redundant storage controllers.
- 26. Tanaka et al., EP 1 037 137 A2: taught a disk array controller including a plurality of host interfaces and disk device interfaces. Duplicated shared memories connected in a one-to-one ratio between each interface and respective access path. A cache memory connected to the interfaces through a selector.
- 27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrice Winder whose telephone number is 571-272-3935. The examiner can normally be reached on Monday-Friday, 10:30 am-7:00 pm.

Art Unit: 2145

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Cardone can be reached on 571-272-3933. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Patrice Winder Primary Examiner Art Unit 2145 Page 12

July 13, 2007